Mitigation Plan

Devils Lake Outlets 2011

June 21, 2011

2011 Devils Lake Outlet Mitigation Plan

Introduction

Beginning in 1993, as Devils Lake began its historically unprecedented rise, the State Water Commission (SWC) has been at the forefront of efforts to combat flooding in the basin. Since 1993, when Devils Lake was at elevation 1422.6 feet above mean sea level (msl), it has risen almost 32 feet to its 2011 record elevation of over 1454 feet msl, expanding from about 49,000 acres in size to over 200,000 acres. At its overflow elevation of 1458 feet msl, where it naturally spills into the Sheyenne River, Devils Lake will cover more than 261,000 acres.

In the mid-1990s, local, state, and federal authorities adopted a three-pronged approach: infrastructure protection for roads, levees, and relocations; upper basin water management including water storage in upper portions of the basin; and discharge through an emergency west-end outlet to the Sheyenne River. The three-pronged approach was designed with the interests of both Devils Lake basin and downstream residents in mind. The principal concept has been to manage water and flood damage within the Devils Lake basin, while attempting to prevent a potentially catastrophic natural overflow through Tolna Coulee to the Sheyenne River. All three prongs are integral to the SWC's Devils Lake flood mitigation efforts. This Mitigation Plan provides direction in addressing potential problems that could arise downstream as an outcome of emergency measures taken at Devils Lake to help protect the safety and general welfare of both the basin and the downstream residents.

Plan Components

There are two key components to reducing the risk of downstream damages from a Devils Lake overflow. The first has been the construction of emergency outlets to remove floodwater from Devils Lake in a controlled fashion to help prevent new damages around the lake and reduce the risk of a natural catastrophic spill. The second is addressing issues downstream along the Sheyenne River that may result from the emergency outlet projects.

Emergency Outlets

The growing risk of a natural catastrophic overflow from Devils Lake to the Sheyenne River has been recognized for several years. As the lake has continued to rise, so too has the potential for a natural overflow. Recent estimates put the likelihood of a natural overflow to the Sheyenne River at almost 9% by 2012. In consideration of the fact that many large-scale flood control projects are built when there is only a 1% chance of flooding in any single year, the comparative level of risk that exists for a natural spill at Devils Lake today is extremely high.

The original 100 cubic feet per second (cfs) emergency west-end outlet completed in 2005 was expanded to 250 cfs in 2010, but that is insufficient. The need for additional outlet capacity is in direct response to an ongoing series of extremely wet years that continue to dramatically raise Devils Lake's elevation. Because of the real threat of a catastrophic overflow, the state is pursuing three additional outlet-related alternatives concurrently.

1) The SWC is constructing a new East Devils Lake outlet with a design capacity of 350 cfs is expected to be in place in spring, 2012. This will bring the total discharge capacity from the pumped outlets to 600 cfs.

2) The SWC is currently considering a controlled gravity flow emergency water transfer channel from West Stump Lake to supplement the existing West End Outlet, and the East Devils Lake Outlet currently under construction. The third outlet design would include a gravity flow channel with a bottom elevation of 1,452' that would allow water to flow directly out of West Stump Lake, and into the Tolna Coulee, where it would make its way to the Sheyenne River. If pursued, this project is estimated for completion in spring, 2012. As designed, flows from the gravity outlet could range from 27 cfs at a Stump Lake elevation of 1,453' msl, to 668 cfs at a Stump Lake elevation of 1,458' msl.

3) The SWC is working with the U.S. Army, Corps of Engineers on a control structure just upstream of the divide where Stump Lake, now part of Devils Lake, spills naturally toward the Sheyenne River through the Tolna Coulee. This control structure will allow Devils Lake to overflow at its current natural spill elevation of 1,458' msl, at an initial rate dictated by the local terrain. The new structure will, however, control flow should erosion occur naturally, with the goal of preventing high flows in the Sheyenne River. This will significantly reduce the potential for catastrophic downstream damages. Erosion that would reduce the spill elevation of Devils Lake will still occur, but the discharges will be controlled.

Downstream Erosion Mitigation

The second component of this mitigation plan specifically addresses concerns of downstream landowners adjacent to the Sheyenne River. This procedure is established to address potential downstream problems that result from operation of the west-end and East Devils Lake and gravity flow emergency outlets.

Because the SWC recognizes and takes seriously the concerns of downstream landowners, a significant amount of information has already been gathered on baseline conditions along the Sheyenne River. Aerial surveys for documenting erosion problem areas and multiple biological assessments of the Sheyenne River have been conducted over the last decade. A new aerial survey was conducted in 2011.

Emergency Outlet Operations

The West Devils Lake, East Devils Lake, and Stump Lake gravity flow outlets will be managed with the objective of balancing the discharge of water with protection for those downstream. As a result, when the Sheyenne River is flooding or significant precipitation events are forecasted, outlet discharges will be adjusted to mitigate the risk of compounding high flow problems. Operation of the outlets is intended to reduce the possibility of a natural overflow, thus preventing the severe downstream flood and damages that could result from an uncontrolled spill.

If problems are identified that are demonstrably the result of outlet operations, operational changes will be considered to resolve those issues.

Sheyenne River Channel Capacity

The in-channel capacity of the Sheyenne River above Baldhill Dam is approximately 600 cfs. The SWC anticipates that natural flows in combination with Devils Lake outlet discharges may exceed bank capacity in some areas. Flowage easements with adjacent landowners may be pursued where occasional over-bank flooding is likely to occur.

Mitigation Procedures

The SWC has established procedures to work with riparian landowners concerning problems that may result from outlet operations. Landowners are encouraged to document and report erosion and other issues so their concerns can be objectively and consistently analyzed. SWC review of a reported problem site will be completed in a timely manner. This review will include analysis of all information available and may require site visits with the affected landowner.

The Sheyenne River naturally experiences highly variable conditions, varying between extreme flooding and near zero flow. Similarly, water quality has historically varied considerably. Because of these natural variations in the aquatic condition, it is important that any claims of outlet affects be differentiated from what would have occurred naturally. Damages will be compensated in proportion, as determined by the SWC to the impacts resulting from Devils Lake outlet discharges. Problem areas brought to the attention of the SWC by the affected landowner(s) will be considered on a case-by-case basis with emphasis on fairness to all concerned.

Filing An Application

In the event that a landowner becomes aware of a possible problem on their land that they believe is related to Devils Lake emergency outlet operations, they must notify the SWC immediately. A copy of the Devils Lake Outlet Mitigation Application Form will be provided.

SWC staff will review the completed Outlet Mitigation Application (see end of document). Claims will be evaluated under the criterion outlined previously in this document. SWC staff will acknowledge receipt of the application within 15 days. Information provided in the form and other data will be used in responding to the landowner with a written reply in a timely manner. In addition, the SWC will inform the appropriate water resource district/board of the mitigation application and SWC decision.

Appeal Process

Appeals will be reviewed by the SWC per NDCC 61-03-22.

Except as more specifically provided in this title, any person aggrieved because of any action or decision of the commission under the provisions of this title has the right to a hearing by the commission if no hearing on the matter resulting in the action or decision has been held. If a hearing has been held, the person aggrieved has the right to petition for reconsideration and to appeal, all in accordance with the provisions of chapter 28-32.

Devils Lake Outlet Management Advisory Committee

The Devils Lake Outlet Management Advisory Committee, a statutorily established entity (NDCC 61- 36), will be advised of all applications and the SWC's response to those applications.

Mitigation Program Funding

The SWC maintains a portion of its biennial budget to address general water management projects across the state. Cost-share for a variety of local water management projects, including the Devils Lake Outlet Mitigation Plan, are supported with this funding.

Devils Lake Outlet Mitigation Application Form

Project # 416-t0

PART A - (Applicant must fill out items 1-6)

1) Applicant name(s): _____

   Address (Street, City, State, Zip): _____

   Phone: _____

   Cell phone: _____

2) Application date: _____

3) Location of problem(s) (sec/twp/rg, provide map if available): _____

_____

_____

4) Date problem occurred (from-to): _____

5) Describe the problem, including: structures damaged, acres affected, or bank footage lost: _____

_____

_____

_____

_____

_____

6) Description of problem (Please attach any additional information such as photographs or maps that will describe your claim): _____

_____

_____

_____

_____

_____

_____

PART B - (This portion to be filled out by SWC staff)

7) Decision and explanation of the State Water Commission regarding claim:

8) Application reviewed by: _____

9) Date of SWC decision: _____

10) Date of landowner notification: _____

11) Name of Water Resource District notified: _____

12) Date of Water Resource District notification: _____

Contact information
For further information on
Devils Lake Outlet Mitigation,
please contact the SWC at:

Mailing Address:
North Dakota State Water Commission
900 East Boulevard Avenue, Dept. 770
Bismarck, ND 58505-0850

Phone: (701) 328-2750
Fax: (701) 328-3696
TTY: (800) 366-6888 or 711:TTY
Email: swc@nd.gov

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